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This paper presents an analytical methodology for neotonal music that is based upon the writings of Hindemith (1942) and Etler (1974). After establishing a gradation that orders intervals from the most stable to the most unstable, a theory of interval resolution is presented. An analysis of an interlude from Hindemith's *Ludus Tonalis* demonstrates applications of the methodology and particularly how specific intervallic treatments permeate various levels of structure.

MODIFIED CONTRAPUNTAL CONVENTIONS:

STABILITY AND INSTABILITY IN THE

NEOTONAL MUSIC OF HINDEMITH

by

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APPROVAL PAGE

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CHAPTER I

INTRODUCTION

Writings on twentieth-century neotonal counterpoint have largely been limited to a more stylistic approach, rather than a species, or note-against-note, approach.[1] The former refers to the identification and analysis of contrapuntal techniques such as imitation, inversion, and retrograde or to the adaptation of contrapuntal forms, such as fugue or canon, in twentieth-century neotonal works. The latter refers to the identification and analysis of the vertical interaction of two or more lines in contextually consonant or dissonant settings.

Two recent writings have posited differing analytical methodologies for neotonal music. Henry Martin (2001) discusses twentieth-century counterpoint in terms of a species approach, and he quantifies, or gradates, the degree of consonance or dissonance, rather than describes how the dissonances behave around or resolve to more consonant sonorities. Neil Minturn (1997), in his analysis of the music of Prokofiev, uses transformational theory to "rescue wrong notes from the maw of traditional consonance and dissonance and [to] show their large-scale impact as well their local distinctiveness" (23). In contrast to Martin and Minturn, my approach will explain how the treatment of vertical sonorities in tonal music was imported into the compositional practices of neotonal composers in newer, freer contexts yet still is allied to a traditional, species

[1] Owen (1992) provides a selected bibliography that includes resources on both traditional and twentieth-century contrapuntal idioms.

treatment of consonance and dissonance. In contrary to Schoenberg's "emancipation of the dissonance" dictum, my methodology will, like traditional species counterpoint approaches, attend particularly to stepwise resolutions of unstable intervals. (Schoenberg, 1926/1975).

In regard to the importation of traditional practices in early twentieth-century music, Joseph Straus observes:

> Traditional elements inevitably retain their traditional associations. As a result, they become the locus of a productive musical tension. They evoke the traditional musical world in which they originated, even as they are subsumed within a new musical context. . . . [Twentieth-century composers] invoke the past in order to reinterpret it (1990, 1).

Where, then, can we turn to understand how tonal traditions, specifically that of counterpoint and the treatment of dissonance, were imported into neotonal practices? One possible avenue is in the music and theoretical writings of Paul Hindemith.

Hindemith's break with romanticism and expressionism can be viewed as an aesthetic position. Hindemith believed that music could be aesthetically pleasing without the need for any programmatic components: "Music has to portray the spirit of our time and consequently make use of impersonal, unsentimental, nonseducing, antiromantic sounds" (Hindemith 1952, 36). This attitude toward art was not limited to Hindemith or to music. Elliott Antokoletz observes that

> . . . many German artists and writers, in reaction to the intense emotional aesthetics and psychological attitudes of the Expressionists, established a movement known as the *neue Sachlichkeit*, or "New Objectivity," which advocated a return to simplicity, austerity, and a directness of expression devoid of the superfluous elaborations that had been acquired in the arts throughout the preceding eras (1992, 284).[2]

Also allied with this aesthetic approach was the belief in the functional nature of music. Hindemith wished to close the gap between the composer, the performer, and the general public, or audience, created by "music [that was] based on an individualistic approach geared especially to the elite" (Antokoletz 1992, 291). Hindemith turned to a style that he believed could be understood by all and would serve a role in society. He became an advocate of *Gebrauchsmusik,* music that was specifically intended for performance by amateur musicians.[3] This attitude toward music can be viewed as a direct effect of the preceding war. Following Germany's defeat in World War I, the German populace embraced a more proletarian-oriented culture: "Berlin shook off its imperial past and reinvented itself as the prototype of media-saturated urban cultures to come . . ." (Ross 2007, 195).

Hindemith's style and method of composition, then, is in keeping with the above sentiments: "for Hindemith the object of [the New Objectivity] was always synthesis, reconciliation of past and present" (Neumeyer 1986, 3). Hindemith had read theoretical treatises from all periods of Western art music, including his own era. As a result of his

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[2] Hindemith did not turn to the ideology of the New Objectivity until 1923. His works up until that time were filled with experimentation and drew influences from a variety of composers, some of whom (namely Debussy) can be described as more "modern." See Neumeyer (1986, 4).
[3] Hindemith preferred the label *Sing-und-Spielmusik* for music that he wrote for amateur musicians, (Antokoletz 1992, 285).

study, he adopted the ancient and medieval belief that "music is a science and not an art, and like a science, is governed by laws derived by reasoning from accurate natural facts" (Hindemith 1952, 27).

For Hindemith, the overtone series and combination tones served as the "accurate natural facts" from which he would draw the majority of his new theories of music. In *The Craft of Musical Composition*, he attempted to reconcile the concept of tonality with more modern concepts. Searle observes: "the problem which Hindemith attempts to solve . . . is that of the free use of all the twelve notes of the chromatic scale within a tonal framework" (1954, 55). This problem should not be confused with the *equal* use of all twelve tones, a more radical solution advocated by Arnold Schoenberg. Rather, Hindemith's music often moves from one diatonic collection to another while still retaining a connection to an original tonic. The chromatic scale was given a higher status than during past periods:

> Hindemith wanted to reverse the priorities of traditional theories of harmony and melody: where chromatic tones and chords had been understood as special cases (by embellishment or alteration) which could be referred to or reduced to underlying diatonic patterns, he understood the diatonic as a special case of the fully chromatic (Neumeyer 1986, 25).

As Hindemith states: "Everything that can be expressed in the diatonic system can be equally well expressed with this chromatic material, since the diatonic scales are contained within the chromatic" (Hindemith 1942, 48). The degree to which a given harmonic area is related to the overall tonic is expressed in Hindemith's Series 1, a

continuum of his assumed proximity of the various degrees of the chromatic scale to a referential tonic.

Hindemith also posited theories that govern lower-level structures. His Series 2 is a rank-order listing of the various harmonic intervals from most consonant to most dissonant.[4] Series 2 is markedly different from Series 1 in that it does not relate every tone to a progenitor tone. Instead, combination tones are used as the basis for ranking the intervals. Hindemith's reliance on combination tones has been identified as a major flaw in his theoretical system—these tones are not audible enough to bear any weight upon the consonance or dissonance of an interval.[5] However, the main point that should be considered is that Series 2 presents a hierarchy of relative consonance and dissonance using the interval as the "basic unit of musical construction" (Hindemith 1942, 57). With the use of the overtone series and intervals, Hindemith attempted to create a "synthesis" of style by conceiving the elements of music first in their more basic forms and then in a contemporary context. Alvin Etler, a student of Hindemith's at Yale from 1942–44, expanded upon Series 2 and demonstrated resolutions of "tense" intervals in his book *Making Music: An Introduction to Theory* (1974).

In this paper, I will use Hindemith's and Etler's theories as a basis for analyzing neotonal music. I will show that this music can be understood as a return to an earlier, more contrapuntally-oriented style by considering the interval, not the triad, as the basic unit of construction. Vertical sonorities, therefore, can be better understood as

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[4] In Hindemith (1942), Hindemith never uses the terms consonance and dissonance. Instead he views intervals in terms of their harmonic or melodic strength.

[5] See Plomp, R. and W. J. M. Levelt, "Tonal consonance and critical bandwidth," *Journal of the Acoustical Society of America,* 38 (1965): 548–560.

combinations of intervals rather than as harmonic entities derived of tertian chord-types of the common-practice era. This view allows the formation of chords from intervals other than thirds.

David Neumeyer, in his book *The Music of Paul Hindemith* (1986), evaluates Hindemith's theories and adapts Schenkerian analytical techniques to analyze Hindemith's music in hierarchical "stages." Neumeyer adopts Hindemith's analytical symbols and primarily focuses upon the analysis of harmony and tonality in Hindemith's neotonal music. In his analyses of counterpoint Neumeyer focuses on stylistic traits rather than the treatment of consonance and dissonance. Although I will use Neumeyer's work as a guide, my analyses will differ markedly. The following analysis will show the type of approach this paper will use.

Figure 1.1 presents a resolution of a dissonance in a typical, SATB tonal setting. In the first chord, the only dissonant interval, a minor seventh, occurs between the alto and the soprano. The upper pitch of this dissonance resolves down by step in the following chord with all of the voices supporting this resolution by forming consonant intervals with both the tone of resolution and with each other. The roots of both chords are unambiguous and a clear harmonic progression is present.

Figure 1.1. Tonal Treatment of a Dissonant Resolution

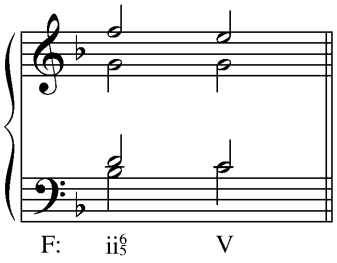
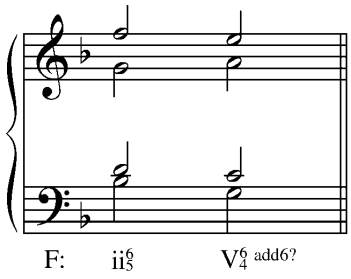


Figure 1.2 presents the same initial dissonance, but within a neotonal setting. The upper pitch stills resolves down by step in the following chord with all voices supporting this resolution by forming consonant intervals with the tone of resolution. The bass voice, however, skips from its initial position to G, which forms a dissonant interval with the alto voice.[6] The root of the second chord becomes ambiguous—it may be perceived as a dominant chord with an added tone or as a iii$^{4}_{2}$. This ambiguity is why a contrapuntal analysis of neotonal music has advantages over other analytical approaches. By focusing solely on the interval makeup of a chord, the analyst does not have to be concerned with determining one and only one root, unlike some traditional tonal analysis procedures, such as *Stufen* theory, that dictate determining what the root of a chord is and how the root functions within a scale-degree framework.

Figure 1.2. Neotonal Treatment of a Dissonant Resolution



In Chapter 2, I will explore theories presented in Hindemith (1942) and Etler (1974) that relate to the treatment of consonance and dissonance. I will then present my own theory based on these writings and the writings of other authors. The conception of

[6] The perfect fourth that is formed between the tenor and the bass can either be considered dissonant or consonant depending on the succeeding chord and will be addressed later in this paper. For now, it is assumed consonant.

the perfect fourth as either a consonance or dissonance has been a long-contested issue. The greater use of this interval as a consonance in neotonal music, especially that of Hindemith's, is a staple of this musical style. A discussion of this interval as it is used in various contexts is included. The process of elision and other factors that accompany resolutions are also discussed. In Chapter 3 I present an analysis of a neotonal work, the *Interludium in A♭* from Hindemith's *Ludus Tonalis* (1942), and adapt Schenkerian methodology, in a different way than Neumeyer, to construct a graph of this movement and discuss specific structural aspects of this work that coincide with the theory presented in Chapter 2. *Ludus Tonalis,* or "Play of Tones" (subtitled "Studies in Counterpoint, Tonal Organization, and Piano Playing"), is the culminating work that demonstrates the theories posited in Hindemith's *The Craft of Musical Composition.* The work was written in 1942, the same year the theoretical part of *Craft* was published and during his tenure as professor of theory and composition at Yale. Influenced by Bach's *The Well-Tempered Clavier* and *Art of Fugue,* the work has a specific tonal organization that corresponds with Hindemith's Series 1. The work begins with a prelude then presents a series of fugues on variations of the same subject. The tone centers of the fugues follow Series 1 with C as the progenitor. Interludes occur after each fugue, serve as modulatory devices between tone centers, and sometimes quote the subject. The work ends with a postlude that is a retrograde inversion of the prelude. I have chosen the *Interlude in A♭* for analysis because of its simpler texture that allows for easier tracking of voices and unstable interval treatment.

CHAPTER II

A THEORY OF STABILITY, INSTABILITY, AND RESOLUTION

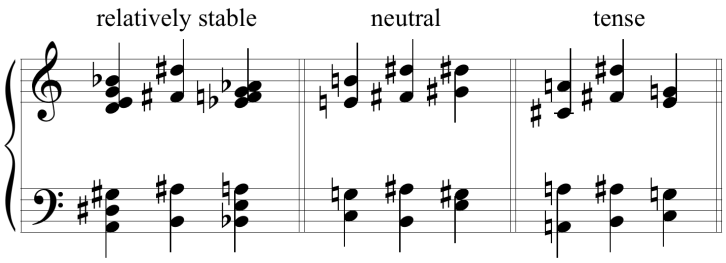
Interval Gradation

For an analysis of neotonal music, a gradation of intervals from stable to unstable is needed for a number of reasons. It allows the analyst to distinguish chord tones from nonchord tones, particularly in nontraditional chord structures, such as those that are not of tertian origin, where a conventional root progression cannot be easily asserted. Stability in this context is defined as intervals that need no resolution and are usually those traditionally termed "consonant," or "perfect" and "imperfect"; unstable intervals, therefore, are ones that require a resolution and are usually those traditionally termed "dissonant." The nature of consonance and dissonance is a highly debatable issue. Both Etler (1974) and Hindemith (1942) do not use these terms, preferring to use instead "stable" and "tense." I adopt "stable" and "unstable" as terms because the definitions of consonance and dissonance in traditional terms are too limited in scope.

In a context where the most unstable intervals, such as minor seconds, dominate, those of slightly lesser instability, such as minor sevenths, can be perceived as having greater stability. The reverse is also true. In a context where the most stable intervals dominate, those of slightly lesser stability can be perceived as having greater instability. Figure 2.1 reproduces Example 4.3 from Cope (1997). Here the middle chord is perceived in various states of stability depending upon the surrounding context. If the

chords surrounding it are more unstable in their intervallic content, then the chord is heard as more stable. If, however, the surrounding chords are made up of stable intervals, then this chord is heard as more unstable. In the first setting of the example, the B major-seventh chord is perceived as relatively stable because the chords before and after it consist of more unstable intervals; in the second setting, the B major-seventh chord is considered neutral because the surrounding chords are seventh chords of the same quality; in the final setting, the B major-seventh chord is perceived as tense because the other chords do not contain any unstable intervals.

Figure 2.1. Surrounding Context Determines Stability (Cope 1997, 40, Example 4.3)



Stability favors the elevation of one tone over another according to the level of stability that tone produces with others in the surrounding context. When two stepwise melodic tones are sounded in succession in a single chordal setting, the one considered more stable is more likely to be considered a chord tone. Factors such as durational and metrical accent can sometimes hinder analysis since nonchord tones are sometimes more stressed than chord tones. A gradation can also judge the amount of stability present in a given setting. A more unstable construction will produce more forward momentum than a less unstable one when resolved. An unstable construction can also give more weight to

the following chord when it is resolved in a particularly strong fashion, such as when both tones resolved by stepwise motion. By observing resolution patterns, one can better judge where cadences and higher structural chords occur. Rameau, in his *Treatise on Harmony,* writes about this aspect of chordal progression concerning the perfect authentic cadence:

> Of the two sounds in the bass which prepare us for the end of a piece, the second is undoubtedly the principal one, since it is also the sound with which the whole piece began. As the whole piece is based on it, the preceding sound should naturally be distinguished from it by something which renders this preceding sound less perfect. If each of these sounds bore a perfect chord, the mind, not desiring anything more after such a chord, would be uncertain upon which of these two sounds to rest. Dissonance seems needed here in order that its harshness should make the listener desire the rest which follows (1971, 62).

Intervallic content is not the sole determining factor for stability, however—scale-degree function can play an equally important role. Scale-degree function usually appears in neotonal music in one of three ways: 1) through complete common-practice period allusion, 2) through rapid progression of tonal centers, or 3) through the retention of the strongest tonal progressions, namely root motions by fifth and leading-tone progressions. Scale-degree function will continue to be addressed throughout this paper.

I have chosen as the basis of my gradation the least contestable facet of the debate: the primacy of the P1, P8, P5, and, to a lesser degree, the P4 as the most stable intervals. There are a number of theories that regard these intervals as the most stable. They are the first to occur in the harmonic series (the P4 is not formed above the fundamental tone, but does occur early in the series), they were the first to occur historically in Western polyphonic music (medieval organum), and their mathematical

ratios are the simplest (Pythagoras). If these intervals are accepted as the most stable, then the rest of the intervals may be compared to them in order to complete the gradation.

Figure 2.2. Interval Gradation

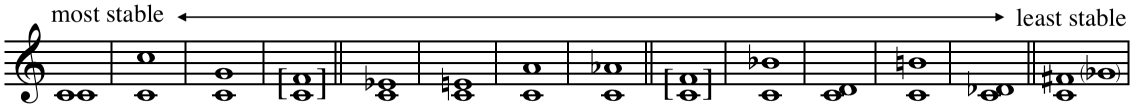


Figure 2.2 presents a gradation from the most to the least stable interval type using only simple intervals. Compound intervals are considered equal to their simple counterparts on a theoretical basis, but this consideration may be affected in a given context.[1] This gradation is markedly different from Hindemith's Series 2.[2] Because of his reliance on combination tones, he places intervals that are inversionally equivalent next to one another. The stability of an interval in my gradation is based mostly upon how far one of its tones must travel stepwise in order to resolve to a more stable interval. Recent studies have speculated that certain "musical forces" influence how tonal music may be perceived. Three of these forces have been prominent in the writings of Steve Larson—*musical gravity*, "the tendency of notes above a reference platform to descend"; *musical magnetism*, "the tendency of unstable notes to move to the closest stable pitch, a tendency that grows stronger as the goal pitch is closer"; and *musical inertia*, "the tendency of melodic motion to continue in the pattern perceived."[3] Musical magnetism, and, to a

[1] Critical bandwidth may factor into the stability of an interval. As intervals are played further into the lower octaves, the perception of stability shifts to favor only the most stable intervals.
[2] Series 2 presents the following intervals as the most stable to the most unstable:
P8, P5, P4, M3, m6, m3, M6, M2, m7, m2, M7, TT.
[3] Larson and VanHandel (2005, 119).

lesser extent, musical gravity, bear direct correlations to the method governing my gradation.

The P1, P8, and P5 are given the most stable statuses, respectively, because of reasons stated earlier, but also because none of these intervals have a stepwise connection to a more stable interval. The P4 is the next most stable, but the brackets in Figure 2.2 denote the P4's contextual nature. The long-accepted notion that the P4 is consonant when it occurs between upper voices (in an $\frac{6}{5}$ sonority, for example) and dissonant when it occurs with the bass voice is upheld here; therefore the P4 is given two places in the gradation to denote its relative strength when used as either a stable or unstable interval.

Imperfect intervals follow the perfect intervals. An interval is accorded greater stability if it resolves to a less stable interval than to a close counterpart; stated another way: the greater the stability of the resolving interval, the less stable the initial interval becomes. Thirds are considered more stable than sixths because if a stepwise resolution is effected, thirds resolve to a P4—a less stable interval than the P5. Sixths are placed after thirds because their stepwise resolution is to a more stable interval, the P5, than the thirds' resolution to a P4, thus giving them less stability. The minor third is considered to be more stable than the major third because one of its tones has a greater distance to travel in order to resolve to a P4. The same criterion applies to sixths—one of the tones of the major sixth has further to travel to arrive at a P5, therefore giving it more stability than the minor sixth. As Reti states:

> the ear will always be inclined to understand any combination of two or more simultaneously sounding notes as a dissonance, *if there is a more consonant combination in the immediate neighbourhood into which the dissonance can be resolved* . . . (1958, 10, emphasis original).

This same resolution criterion is applied to sevenths and seconds. Sevenths resolve to sixths, seconds to thirds.[4] Sevenths are considered more stable than seconds because they resolve to a less stable interval. Because the major seventh and minor second have further to travel to resolve (a whole step) to the major sixth and minor third respectively, these two intervals are placed after the minor seventh and major second.

Finally, the tritone is considered to be the least stable interval because in order to effect its strongest sense of resolution (particularly in a two-part setting), *both* tones must move: the augmented fourth to a sixth, the diminished fifth to a third. Enharmonic spellings for all intervals are considered as stable as their simpler counterparts, particularly in neo-tonal music where enharmonic spellings are used for ease of reading due to its chromatic nature: "Again excepting the augmented fourth and diminished fifth, augmented and diminished intervals result from *enharmonic spellings,* often employed to simplify notation" (Etler 1974, 10, emphasis original). For example, the diminished seventh is considered as stable as the major sixth acontextually. In tonal music, the diminished seventh is typically used as a double leading-tone progression: Ti to Do in the

[4] Here I refer to the common-practice period method of resolving dissonant intervals downward. Sevenths can resolve to an octave, the seconds to a unison. These resolutions do occur in the common-practice period, but almost exclusively as non-chord tone elaborations, not as resolutions of a structural chord tone dissonance. I will discuss this situation more later in the chapter.

lower voice, Le to Sol in the upper voice. The scale degree functions present here are what account for its instability, not the interval itself.[5]

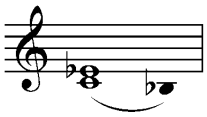
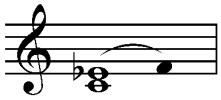
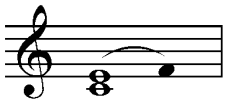
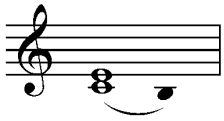
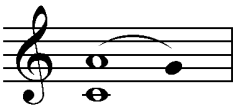
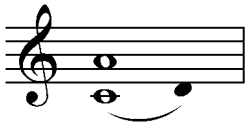
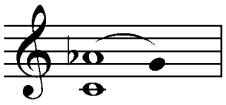
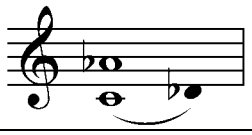
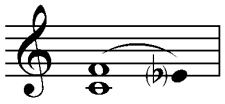
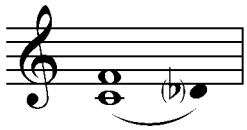
Particularly in the music of Hindemith, chords built on quartal rather than tertian intervals gain a new prominence. In common-practice music, when the perfect fourth involves the bass, it is usually considered dissonant; when it lies between two upper voices that are individually consonant with the bass, it is considered consonant. With tertian sonorities as the basis for construction during this period, the perfect fourth, when functioning as a dissonance, was almost always resolved to a third. As the triad began to give way as the sole governing force, the perfect fourth was freed from its subordinate relationship to the third. Composers began to skip or leap away with either tone of the perfect fourth, thereby affirming its consonant status. If the perfect fourth does resolve one of its tones by step, it can be considered as an unstable interval, but as the mildest of those intervals. Most often in neotonal music, the perfect fourth occurs in a context where there are other, more unstable intervals present, and it is usually the expectation of the resolution of these intervals that motivates the drive to the following chord. For example, if a three-note chord is built upon stacked perfect fourths, a minor seventh occurs between the outer tones, and it is usually this more unstable interval that is resolved.

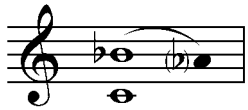
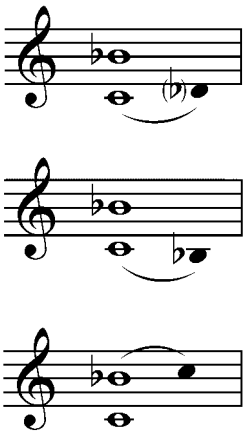
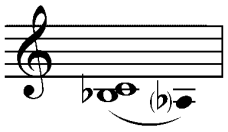
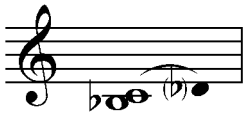
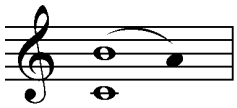
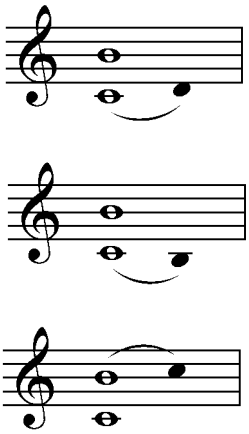
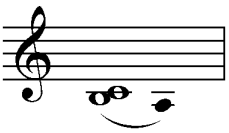
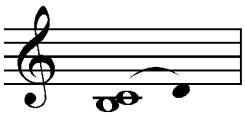
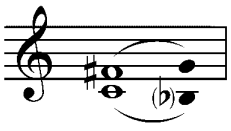
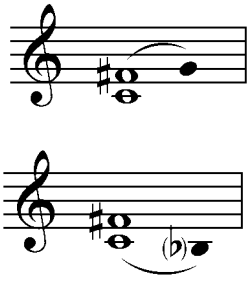
[5] See Harrison (1995, 173) where he writes of the role of diminished sevenths, diminished fifths, and augmented sixths as unique position-finding intervals.

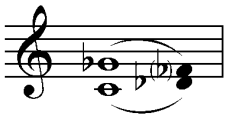
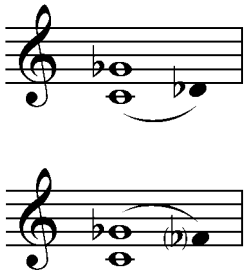
Interval Resolutions

Figure 2.3 presents a table of interval resolutions. All of these resolutions are present throughout Etler (1974), but the designations of strong and weak resolutions are mine.

Figure 2.3. Interval Resolutions

INTERVAL	STRONGEST RESOLUTION	WEAKER RESOLUTION(S)
Minor Third		
Major Third		
Major Sixth		
Minor Sixth		
Perfect Fourth		

Minor Seventh		
Major Second		
Major Seventh		
Minor Second		
Augmented Fourth		

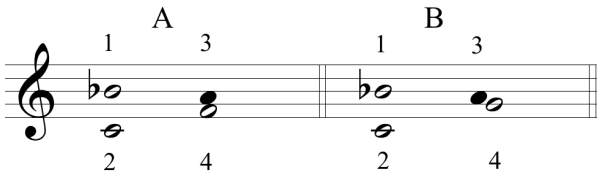
Diminished Fifth		

Musical gravity and magnetism have a direct correlation to the interval resolutions in Figure 2.3. Excepting tritones, all of the resolutions occur with movement to the nearest note or notes available that can form a consonance, and all of the strongest resolutions involve downward motion, coinciding with musical gravity. Most weaker resolutions only support music magnetism as the sole governing force, excepting those that involve downward motion.

In Figure 2.3 the non-resolving tones are stationary, but, as Etler states below, they are free to form a stable or unstable interval with the resolution tone. Figure 2.4 presents two resolutions of a minor seventh taken from Etler's Example 2.18. At A, the non-resolving tone leaps to form a consonance with the resolving tone; at B, the non-resolving tone leaps to form a dissonance with the resolving tone.

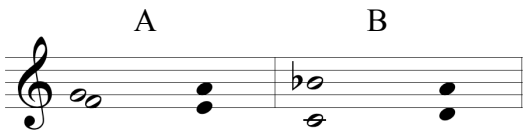
> . . . [T]he essential element of resolution is the decrease in tension between the interval formed by tones 1 and 2 and that formed by 2 and 3. Since the progression of tone 1 to tone 3 in most cases accomplishes this, it is immaterial whether the interval formed by tones 3 and 4 be one of high, low, or no tension (Etler 1974, 15n).

Figure 2.4. Resolutions of a Minor Seventh (Taken from Etler, 1974, 15, Example 2.18)[6]



The resolutions in Figure 2.3 occur mostly between two intervals that are close in the gradation of Figure 2.2. Even stronger resolutions occur when a fairly unstable interval resolves to a fairly stable interval. The resolutions in Figure 2.3 of the minor seventh to an octave, the major seventh to an octave, and the weaker resolutions of the tritone demonstrate such an abrupt move from one end of the continuum to the other. These kinds of resolutions can and often do occur when both notes of an unstable interval both move stepwise. Figure 2.5 presents resolutions that "skip" over a closer interval of resolution in the continuum to one that is even more stable, usually a perfect consonance. These types of resolutions almost always occur in both tonal and neotonal settings of three or more voices where the abruptness of the resolution can be lessened by the presence of other intervals that lie within the middle of the continuum.

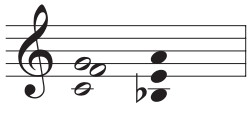
Figure 2.5. Abrupt Motion Through Continuum



[6] In Etler's example, all noteheads are closed. I have used both open and closed noteheads in order to better show the tone of resolution.

Such resolutions as those shown in Figure 2.5 can have a tendency to halt forward linear motion and are often reserved for places where this halting effect is intended, such as cadential points or where a particular harmony is to be emphasized. This halting effect can be subdued in a three- (or more) voice texture where another voice creates an unstable interval with at least one tone of the strong resolving interval, as in Figure 2.6.

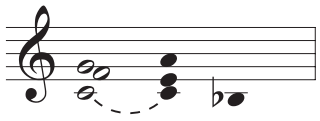
Figure 2.6. Third Voice Creating an Unstable Interval



Elision

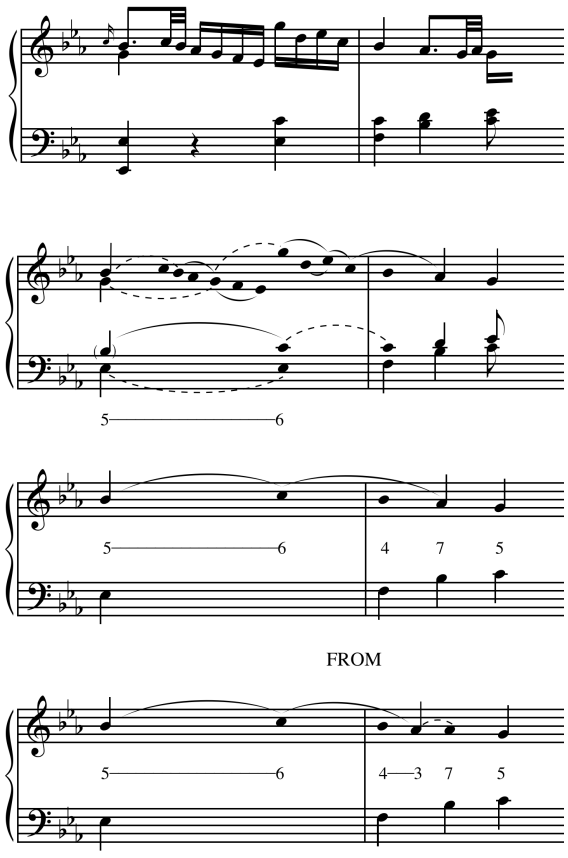
Elision is a powerful factor in the progression and resolution of intervals. Many cases of the appearance of one unstable interval followed immediately by another can be understood as a result of elision. Figure 2.6 serves as an example. Both chords contain at least one unstable interval: the first chord contains a major second, the second both a tritone and major seventh. Figure 2.7 shows a normative resolution (one without elision) of the first unstable interval, the major second, followed by the introduction of the new unstable intervals *after* the first resolution has occurred. This more "involved" process does not create forward momentum as well as the setting that utilizes elision because the unstable intervals do not occur at the same time as the tone of resolution. It also deemphasizes the new tone by placing it after the onset of the others.

Figure 2.7. Normative Resolution of Figure 2.5A



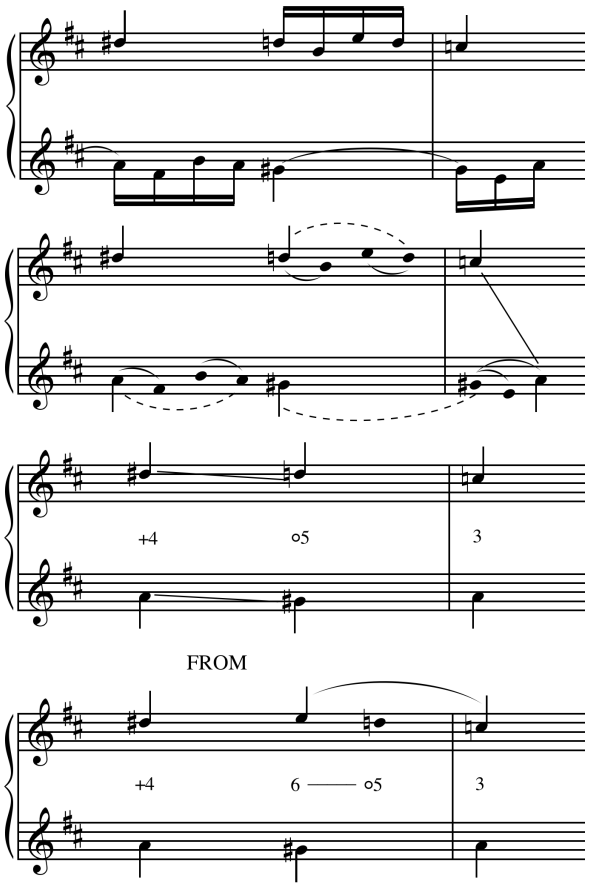
Understanding the elision process can aid in the analysis of chords. The following two examples from the common-practice period show that the elision process can be found long before the twentieth century. Figure 2.8 presents an analysis of mm. 5–6 from the second movement of Mozart's Sonata in B♭, K. 333. The first chord in m. 6 cannot be understood properly without considering elision. Here the B♭ functions as an accented passing tone that does not progress to its goal tone until the harmony has changed from ii to V^7. The final layer of analyis shows the normative resolution without elision.

Figure 2.8. Elision of Accented Passing Tone



Elision can account for seemingly unusual situations, such as the parallel progression of unstable intervals. Figure 2.9 presents an analysis of mm. 29–30 from the first movement of Haydn's Sonata in D, Hob. XVI:14. Here the ear expects the D♯–A tritone to resolve to an E–G♯ (or E–G♮). The A moves to G♯ as expected, but the leading tone D♯ moves to D♮ instead, creating parallel tritones. The normative resolution is for the D♯ to resolve to an E and then progress to a D♮, as shown in the final layer of the figure.

Figure 2.9. Elision Process for Parallel Unstable Intervals



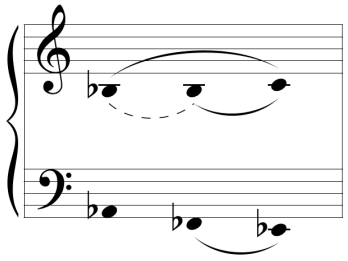
Resolution Factors

There are many instances where nuance may be applied to a resolution. Another voice may take over the resolution in the same octave, allowing the voice that held the resolution to move freely.[7] This situation is much more prevalent in music of homogenous timbre, such as keyboard music, because it is much less pronounced than when an instrument of different timbre takes over the resolution.

[7] In chess, this resolution factor would be considered an increase in "tempo."

A factor that both prolongs and intensifies a resolution is when an unstable interval moves to a more unstable interval before resolving. Figure 2.10 presents the tenor and bass voices of m. 3 of Hindemith's *Interludium in A♭* from *Ludus Tonalis.* The initial unstable interval is a major second where the expectation is for either the upper voice to move up by step or the lower voice to move down by step. The third interval satisfies the first of these resolutions by the move to C in the tenor voice. However, before this resolution occurs, the bass skips to produce an augmented fourth with the tenor's B♭, creating a more unstable interval, followed by the strongest resolution of an augmented fourth that still maintains the C of the initial resolution.

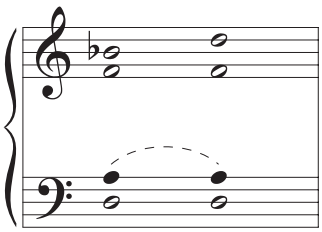
Figure 2.10. Prolonged and Intensified Resolution



Another factor that does occur occasionally is when one tone of an unstable interval is held through to a chord where the instability is released without making a stepwise connection. This event is quite abrupt and, since one tone is held while the remaining ones move, I will term it a "pedal" resolution. Figure 2.11 demonstrates this factor. The A in the tenor voice forms an unstable interval with the B♭. The B♭ then skips in the following chord to a D, which no longer forms an unstable interval with the A. A resolution does occur, but it may be considered weak compared to a stronger stepwise

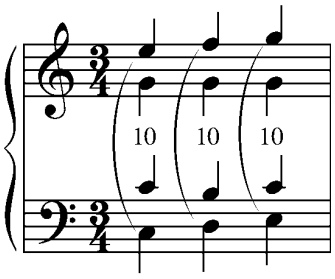
resolution and is more of an elaborative, coloristic trait than a setting that satisfies aural expectation.

Figure 2.11. "Pedal" Resolution



An unstable interval that occurs with the bass is usually considered more unstable than the same interval that occurs between upper voices. Zarlino was the first prominent theorist to argue that voices should be compared to the bass rather than the tenor voice, as had previously been the custom in medieval and Renaissance music theory. The elevation of the bass voice led to the figured-bass system of the Baroque and allowed more lenient treatment of unstable intervals in the upper voices than with those that occurred with the bass. Figure 2.12 presents the progression I–V^4_3–I^6. In a root-position V^7, F would need to resolve because it forms a seventh with the bass; in a V^4_3, however, it is a tenth above the bass and does not need to resolve downward.

Figure 2.12. I–V$^{4}_{3}$–I^{6} Progression



In neotonal music, it is important to consider chords as an amalgamation of their intervals and not only in terms of chord progressions as root successions. Such a consideration requires analysis of how stable or unstable a chord is (and thus its function as either an important structural chord or a chord of elaboration) by determining which stable or unstable intervals are present and in what number. This method of analysis is not all-inclusive, and other contexts may promote the need for another method. An important feature of this amalgamation method is that it is only necessary for one interval, usually the most unstable, to complete a resolution to make a meaningful drive into a subsequent chord. This trait was recognized by Hull, writing as early as 1915:

> Further, if the two notes, or even only one of these, which form the keenest dissonance in any combination be followed in a satisfying manner, the others, whether dissonant or consonant, may be regarded as free.
>
> The resolution of the chosen may be—
> (a) by fall of a second,
> (b) by remaining pedal-wise, or
> (c) by rising chromatically.
>
> The dissonant note may be transferred to another part, or frequently the choice of part, or pitch, for its appearance is immaterial, so long as the resolution chord contains the note it demands (1915, 105).

Stronger connections are possible when more than one interval resolves, and stronger still when multiple intervals resolve using their strongest resolution.

Two factors can weaken a resolution: register transfer and delayed resolution. When register transfer occurs, the resolution is weakened because the ear has a more difficult time tracing how the resolution occurred. This weakening is compounded if the transfer occurs across more than one octave. Because of the difficulty in hearing a connection between two tones that lie two or more octaves apart, transfers of more than one octave are rare and will usually occur within sequential patterns where the resolutions have been firmly established. Delayed resolution is obviously a weakening force because the resolution does not occur when expected and the ear is drawn to other parts of the texture that are not a part of the resolution. Composers will often use this technique to soften a strong resolution in order to avoid the halting effect that may occur. The longer the delay, the greater the softening effect.

CHAPTER III

ANALYSIS

Explanation of Graphing Techniques

The graph of Figure 3.2 (located at the end of the chapter) utilizes Schenkerian techniques and presents four layers of analysis:

a) The foreground has been graphed without any reduction.

b) Most of the nonchord tones have been reduced out, allowing structural tones to become more apparent.

c) The progression and resolution of unstable structural tones with the generic intervals have been labeled below the staff. Solid slurs have been used to denote resolutions, dashed ties indicate the retention of a pitch, and solid lines denote a continued unstable state created either by parallel motion between two intervals of the same size or the progression of an unstable interval to another unstable interval of a different size. Below the staff, dotted lines between numbers coincide with solid slurs and indicate the resolutions of unstable intervals; solid lines between numbers coincide with solid lines on the staff and indicate unstable intervals that progress to other unstable intervals.

d) Structural chords, cadences, and constructions that govern larger time spans have been identified. Interval resolutions, the relative stability of chords, and scale degree functions were used as determining factors.

Analysis Commentary

The graph of Figure 3.2 serves as the primary means of conveying the principles discussed in Chapter 2—the way in which these principles affect longer, more significant aspects of the music is discussed below. I begin by giving an overview of the form because it has a direct bearing on the small-scale organizations used. Figure 3.1 shows the formal organization. The movement is constructed largely on the tone center progression A♭–B–D, with a return to A♭ occurring before D assumes its role in m. 13 (the measure numbers where these tone centers occur are in boldface type in the figure). The division of the interlude by these tone centers is made apparent by two characteristics. First, an $\frac{6}{5}$ sonority, the most stable used in the interlude, occurs at the arrival of each of these centers and nowhere else. Second, significant thematic material begins where each tone center is introduced. That successive tone centers are equidistant—A♭–B and B–D are both three half steps apart—is important in that this trait has a direct correlation with smaller constructions that occur throughout the movement and will be discussed later in the chapter. The influence of Baroque compositional practice is readily apparent by the formal outline. An economy of musical material is used throughout with sequential and episodic sections serving connective and various functions. Once the main theme is fully

restated on D in mm. 13–16, the remaining music serves a codetta-like function that both confirms D as the ending tone center and recalls earlier material.

Figure 3.1. Formal Organization

Measure(s)	**1–2**	3	4	5–7	**8–10**
Tone Center	A♭	E♭	A		B
Thematic Material	a			sequential and episodic	b (significant variation of a)
𝄋 Sonorities	𝄋				𝄋

Measure(s)	**11–12**	**13–14**	15	16	17	18–20	21
Tone Center	A♭	D	A/G	E♭/G♭	D		
Thematic Material	half-return of a	a			false return of a	sequential and episodic	
𝄋 Sonorities	𝄋	𝄋					𝄋

The main theme of the interlude is four measures in length and opens the movement. Motives occur in the opening four measures that will recur throughout the interlude. The music begins with A♭ as the tone center then progresses to E♭ in m. 3, with an intermediate of C in m. 2. The outline of an A♭ major triad with diatonic sonorities occurring at each of these points aids in clarifying A♭ as the overall center at this point in the movement. Though not an equal division like the overall tone center plan, the root motion does progress by thirds, with passing tones as connectors, as seen in layer d of Figure 3.2. The equally divided constructions are reserved for sequential and transitory

sections where the nature of equal divisions allows for tonal ambiguity and transitions between distantly-related tone collections and centers.

Another important trait that occurs in these opening measures is a –m3/+P4 melodic sequence that occurs in the bass and stops at the arrival of E♭ in m. 3. The third progression A♭–C–E♭ is highlighted on the local level with the initial fall of a third at each reiteration of the pattern. This sequence returns again in m. 8 with the next important section of the movement. As the main theme is presented in a varied form here, so, too, is the melodic sequence. The same –m3/+P4 succession begins the sequence but is altered in the second half of m. 9 with the bass falling a major third instead. The major third allows for a different tone collection to be used in the bass, which will ultimately allow for an easier return to A♭ in m. 11 with the sequence extended to greater length relative to its first appearance. When the first half of the main theme returns in m. 11, the bass sequence is given another variation with every other tone of the original sequence treated as a nonchord tone. The resulting structural tones (as shown in layer b) then construct a new –P4/+P5 sequence, but they still create a principal third progression of A♭–C (with passing tone) that appears in the opening measures. When the main theme returns for its final presentation in m. 17, this time centered on D, the bass sequence is absent in order to allow D to settle as the tone center and end the piece. Instead of a sequence, the bass tones surround D with both upper and lower leading tones in order to further emphasize D as the center.

Similarities of tone-center progressions occur between both full settings of the main theme. In the initial setting, the music centers on A♭ for two measures before

moving a perfect fifth above to the dominant, E♭. The progression to E♭ is achieved with a strong dominant root motion of B♭ to E♭. This motion is aided by the resolution of the chordal seventh, A♭, of the B♭ chord. Rather than resolving downward in common-practice manner, the chordal seventh resolves upward to the fifth of the E♭ chord. In observing layer c of mm. 1–2 of the graph, it can be seen that the resolution pattern 7--5 is a central and motivic pattern of these measures, and, the upward resolution of minor sevenths is an integral pattern found in this movement. Because the minor seventh is sometimes used as a stable interval and appears frequently among more unstable intervals, the tones of the minor seventh are not relegated to only their strongest resolutions. After a brief emphasis on E♭ in m. 3, the music progresses to A as tone center. This motion is achieved again through a strong bass motion, this time plagal: F♯ (G♭)–C♯. Instead of an upward-resolving minor seventh, its inversion, the major second, is used. The A♭ and E♭ here act like leading tones to the A♮ and E♮ in the following chord.

The tone-center progressions of these measures are utilized again in the full return that begins in m. 13, though some variation and ambiguity occurs. First, the bass melodic sequence is absent and the theme is harmonized differently and with a thicker texture that gives rise to the climax of the interlude. A perception of a tone-center progression to A occurs prematurely in m. 14, but it is weak and fleeting—a strong root motion does not occur and the treatment of unstable intervals is generally weak. The root motion here is a second, with both sonorities placed in inversion, rather than a stronger dominant or plagal motion. The second that occurs between the B♭ and C resolves strongly with the B♭

resolving to A and the C being retained. This interval combination, however, does not involve the bass and therefore is not heard as prominently. The unstable interval that does occur with the bass, D♭–C, is given a weak treatment with the lower tone moving downward. Also, because of the stepwise motion in the bass, E♭–D♭–C, with the C held in an inner voice, the relationship of the D♭ with the C makes the unstable interval sound like a passing, nonchord tone combination rather than structurally significant.

The arrival of the dominant tone center does occur as it did in the first statement of the main theme, but the movement to it and its arrival are varied. Instead of a dominant root motion, a strong augmented sixth motion of B♭–G♯ to A–A is used, but it is considerably weakened by the harmonization of the incomplete neighbor melodic tone C♯ with the goal tone A of the augmented sixth in the bass voice. The goal tone A in the bass voice is perceived as a passing tone to the G in m. 15. Because the G is placed in the bass voice with relatively stable tones above, ambiguity occurs as to whether A or G is the root of this sonority. Further ambiguity is achieved by the upper and lower leading tones that surround G in this measure. Not only do the double leading tones strengthen G, but the resolution of the resulting diminished tenth, F♯ –A♭, to an octave also plays a role in perceiving G as the tone center. It is interesting to note that G, a perfect fifth below D, is the inverse to A as tone center in its relationship to D. In typical common-practice procedure, the plagal relationship is frequently used towards the end of a given movement. G as a perceivable tone center first appears in m. 15, but is later used without ambiguity in a sequential progression in m. 19. A plagal cadence, G–D, is also used to end the interlude.

The final tone center that is expected to occur with the return of the main theme on D is E♭, if the original relationships are to be preserved. An arrival of E♭ occurs in m. 16, but again some tone center ambiguity is present, though much less than in m. 15. The presence of the D♭ with the G♭ in the bass, a strong perfect fifth, leads the ear to perceive G♭ as the tone center. The dominant bass motion into this measure (C♯ enharmonically equivalent to D♭) also creates ambiguity. Immediately following the G♭ in the bass, however, is an F♭–E♭ progression that confirms E♭ as the tone center. Unlike the previous measure, the ambiguity in m. 16 only occurs at the start of the measure. The unstable interval resolutions of m. 15 to m. 16 diminish the perception of G♭ as tone center because D♭ is not the goal tone of resolution for any interval combination, the D♭ is merely retained as a pitch into m. 16. The G–A major ninth expands by step to resolve to the G♭–B♭ major tenth. These two tones are chord tones of both G♭ and E♭ sonorities, but the resolution of the D♮ to E♭ in an upper voice helps to solidify E♭ as the true goal tone center of this measure.

The treatment of unstable intervals is a key component in sequential passages. The process of elision is integral in providing a constant state of instability and flux and in allowing quick progression from one complex sonority to another. The sequential constructions in mm. 5–6 serve as an example. The first sequence begins with an A sonority and alternates between whole- and half-step ascents in all voices until the arrival of the E♭ sonority at the beginning of m. 6. At the heart of each sonority is a minor triad in first inversion with two upper tones added that serve to create instability and to give

the sonorities a quartal inflection. The resolutions of the two upper tones are chord tones of the previous triad. The uppermost tone of this construction adds the least instability by forming only one unstable interval, a minor seventh, with an inner voice. It is also metrically and durationally unaccented. The second highest tone, however, is given more metrical and durational prominence and causes more instability because it forms two unstable intervals, a minor seventh and a major ninth, with more than one voice, one of which is the bass. The passage moves from A to E♭ with an intermediary of C, creating an equal division of minor thirds. The B and D sonorities function as higher-level passing tones. The arrival of the C sonority is accented because the overall tone collection changes. The first two sonorities of m. 5 create an A Lydian collection; the C and D sonorities create a C Lydian collection that cancels all but one of the sharps of the previous collection. The arrival of the E♭ sonority also creates an accent by introducing two flats and again uses a different collection. Such distantly-related tone relationships are commonplace among equal division constructions.

The E♭ sonority marks the end of one sequence and the beginning of another. A momentary release of instability occurs here with the octave displacement and resolution of the most unstable voice of the previous sequence before it is treated as a free, ornamental voice that sometimes clashes with the tones of the new sequence. Unlike the previous sequence, which took one measure to progress up a diminished fifth, the new sequence traverses an octave in only half a measure. Equal division and elision are again important factors—each sonority is transposed down a minor third while the resolution of each minor seventh creates a new unstable interval and is displaced by an octave to an

inner voice. The sequence of m. 6 is less unstable than that of m. 5 because it involves fewer voices and less intervallic instability, descends rather than ascends, is placed above an E♭ pedal tone in the bass, and only uses one overall tone collection, an octatonic collection on C—the release of instability here is preparing for the cadence and new section that begins at m. 8. The same sequential passage is presented again in m. 19 with G as its tone center.

Two more sequential patterns occur in mm. 8–10. The first centers on B and is not sequential in a strict sense. As stated previously, the bass melodic returns here and is extended and varied; its ultimate goal is the arrival of the E♭ sonority at the end of m. 10, which then creates a strong authentic cadence on A♭ in m. 11. The first sequential passage begins with a perfect fifth sonority and ends with adding a perfect fifth to the original fifth, creating a $^{9}_{5}$ sonority. Between these two are two minor-seventh chords in root position followed by two major-seventh chords in root position. This passage is largely static in nature and centers on B. After the arrival of the $^{9}_{5}$ sonority on B, a 5–6 motion is used that functions as a pivot to the next sequential passage. This motion creates a half-diminished-seventh chord on C♯, with the third omitted, in third inversion. The new sequence presents two variations of the previous one. The seventh-chord types now used are half-diminished and major-minor and they occur in alternation rather than in succession. A strict sequential treatment begins with the D^{4}_{2} and has one copy before progressing to the E♭ chord at the end of m. 10. The first $^{4}_{2}$ chord serves as a setup to the pattern and does not take part in the strict sequential progression following. Unlike the

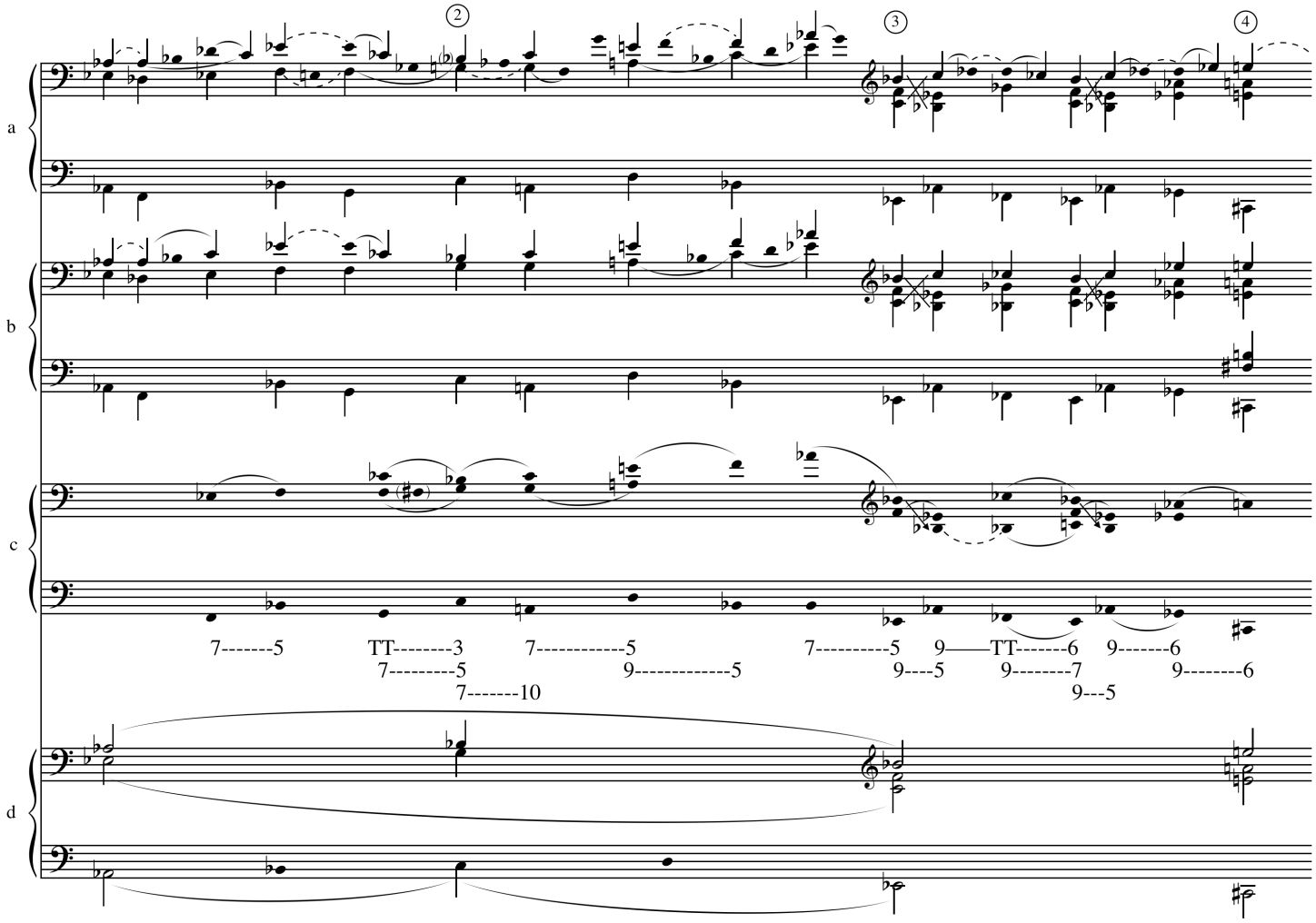
previous passage, a specific unstable interval treatment is utilized. Beginning with the D_2^4, an alternation of augmented fourths and major seconds occur. Each upper tone of these unstable intervals is resolved upward by half step while introducing a new tone that is unstable with the tone of resolution. The resolution pattern culminates in the resolutions of both the major second and augmented fourth of the A_2^4 chord to tones of the E♭ chord: the upper tone of the G–A major second is retained where it becomes the lower tone of a tritone. The tritone, functioning as a diminished fifth, resolves both of its tones inward to B♭ and D♭. The resolution here marks the end of the sequential passage and allows for the authentic cadence to A♭ to occur.

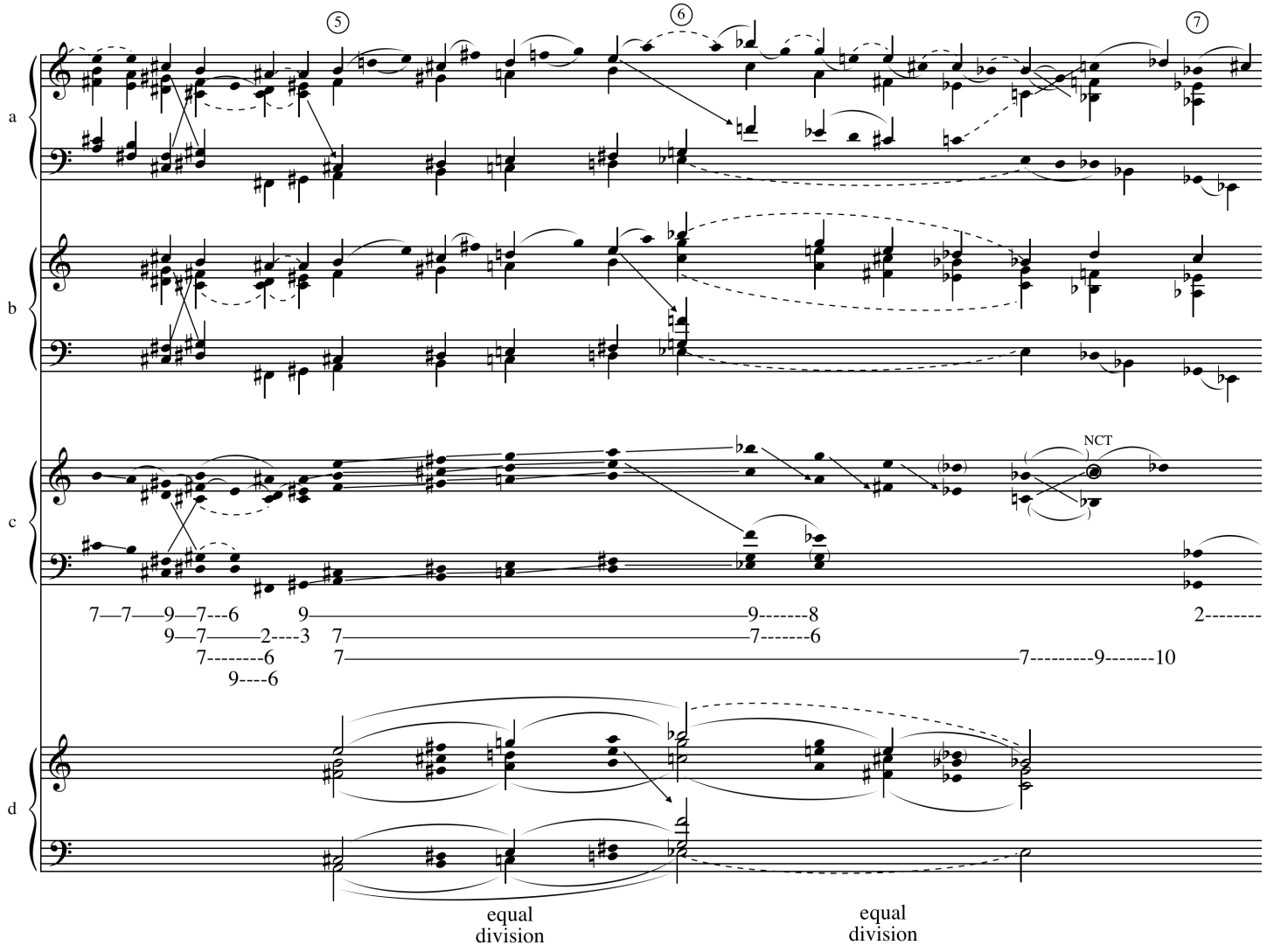
Conclusion

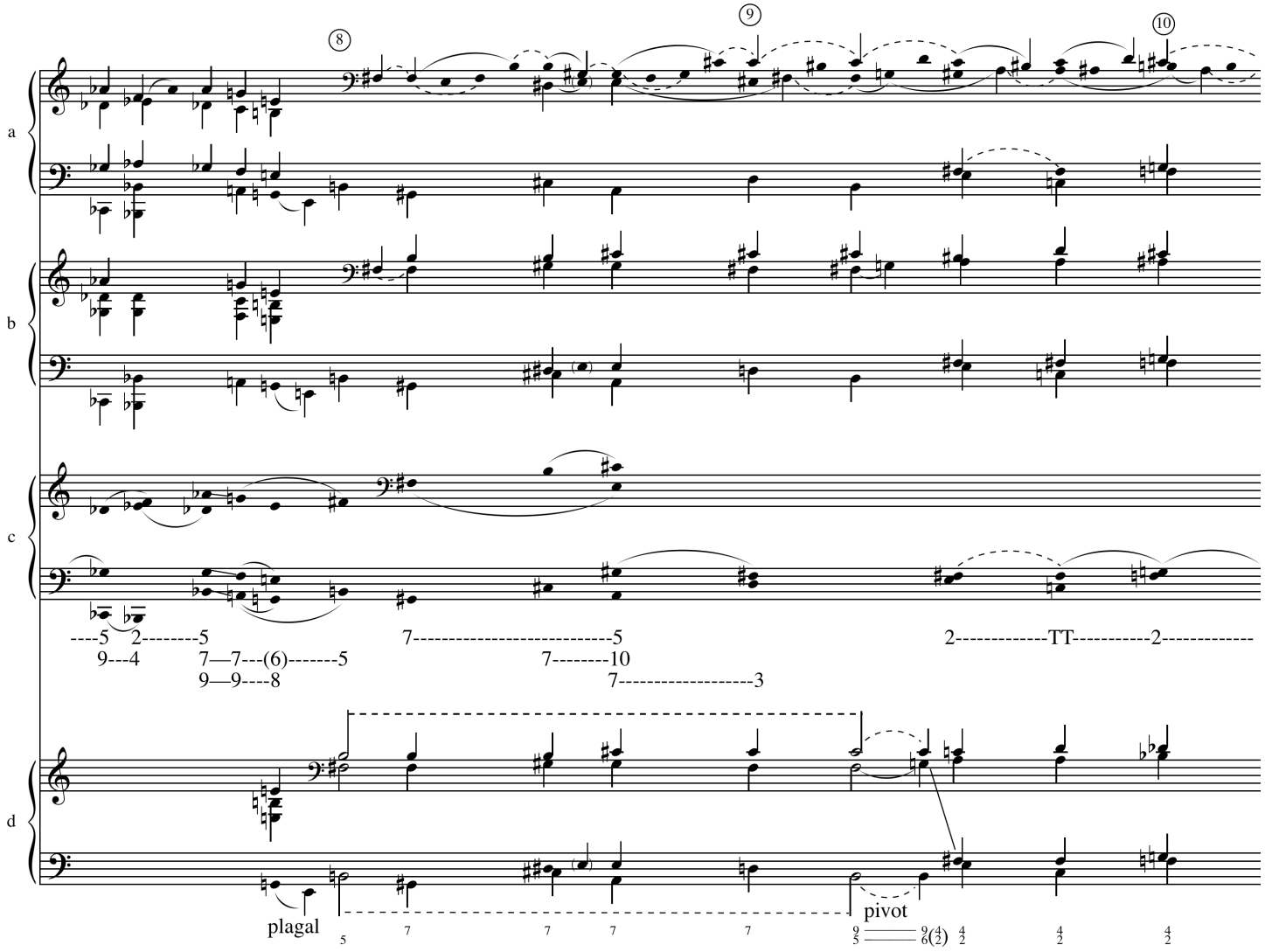
The treatment of stable and unstable intervals permeates all levels of structure. Unstable intervals and their resolutions can aid in the progression from one sonority to another, add motivic content that unifies a passage or entire movement, and perform a central role in complex sequential passages. Neotonal music reuses, reforms, and reshapes the contrapuntal traditions of the common-practice era, which allows for the freer, though still controlled, use of unstable interval combinations. Reexamining the theories of Hindemith and Etler and using them as a basis for intervallic analysis allows for a different method of insight into neotonal music. Since the theory posited in this paper demonstrates how a simpler facet of music can be used to create ingenuity and complexity, it would be interesting to examine in the same manner the music of other neotonal composers, such as Shostakovich, Stravinsky, or Britten, all of whom had

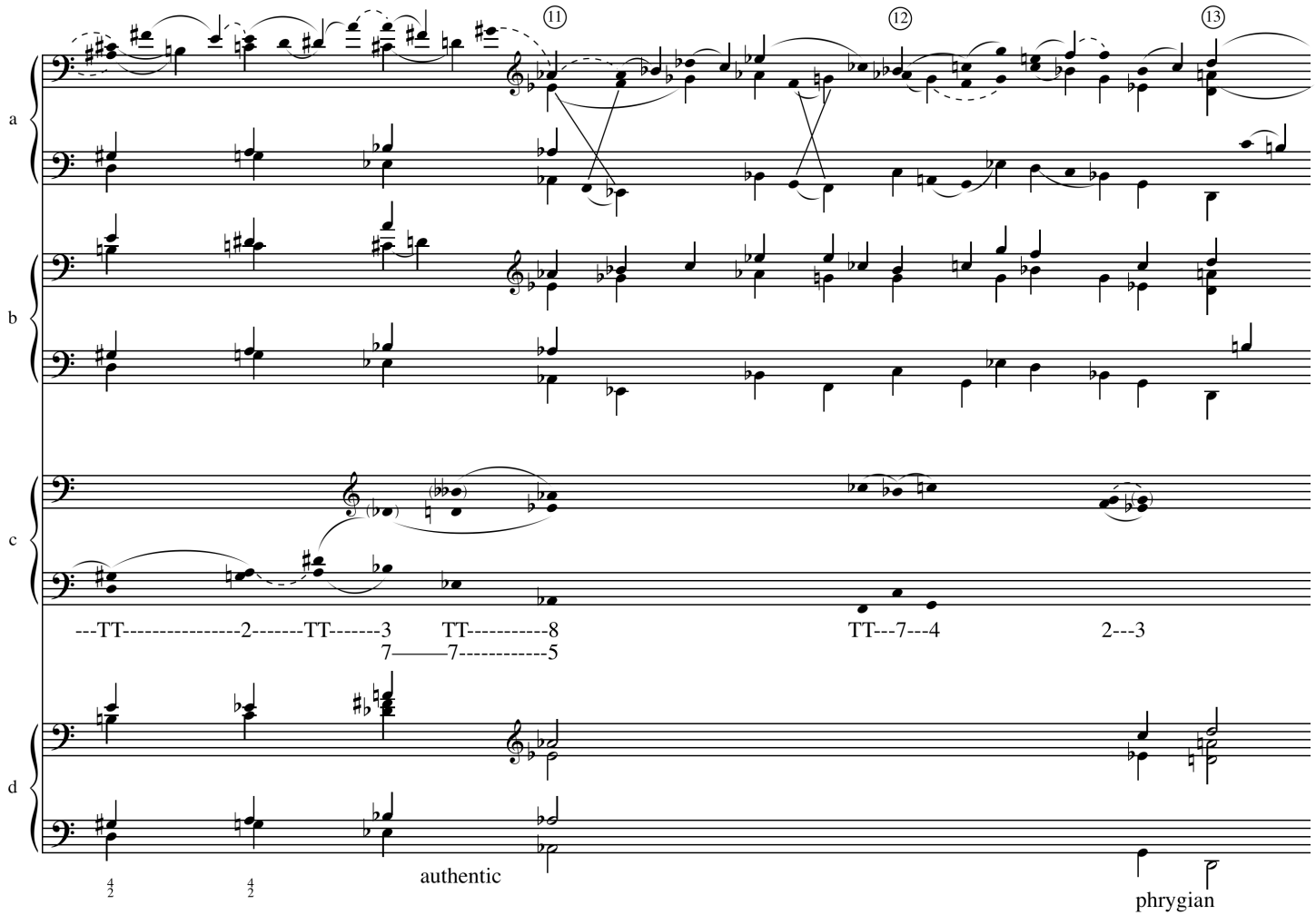
disparate compositional voices, but, like Hindemith, were steeped in the past tradition. No theory encompasses every aspect that arises in real compositional practice, and it is paramount to consider the context that surrounds any given musical passage, particularly when states of stability and instability are to be determined. The gradation of intervals presented in this document is a starting point for the analysis of intervallic content and its function within a given setting and should not be used to dictate any fundamental principle. Stable intervals are often treated as tones of elaboration to unstable intervals of structural importance—consideration of all levels of structure is needed in order to provide a thoughtful analysis of neotonal music.

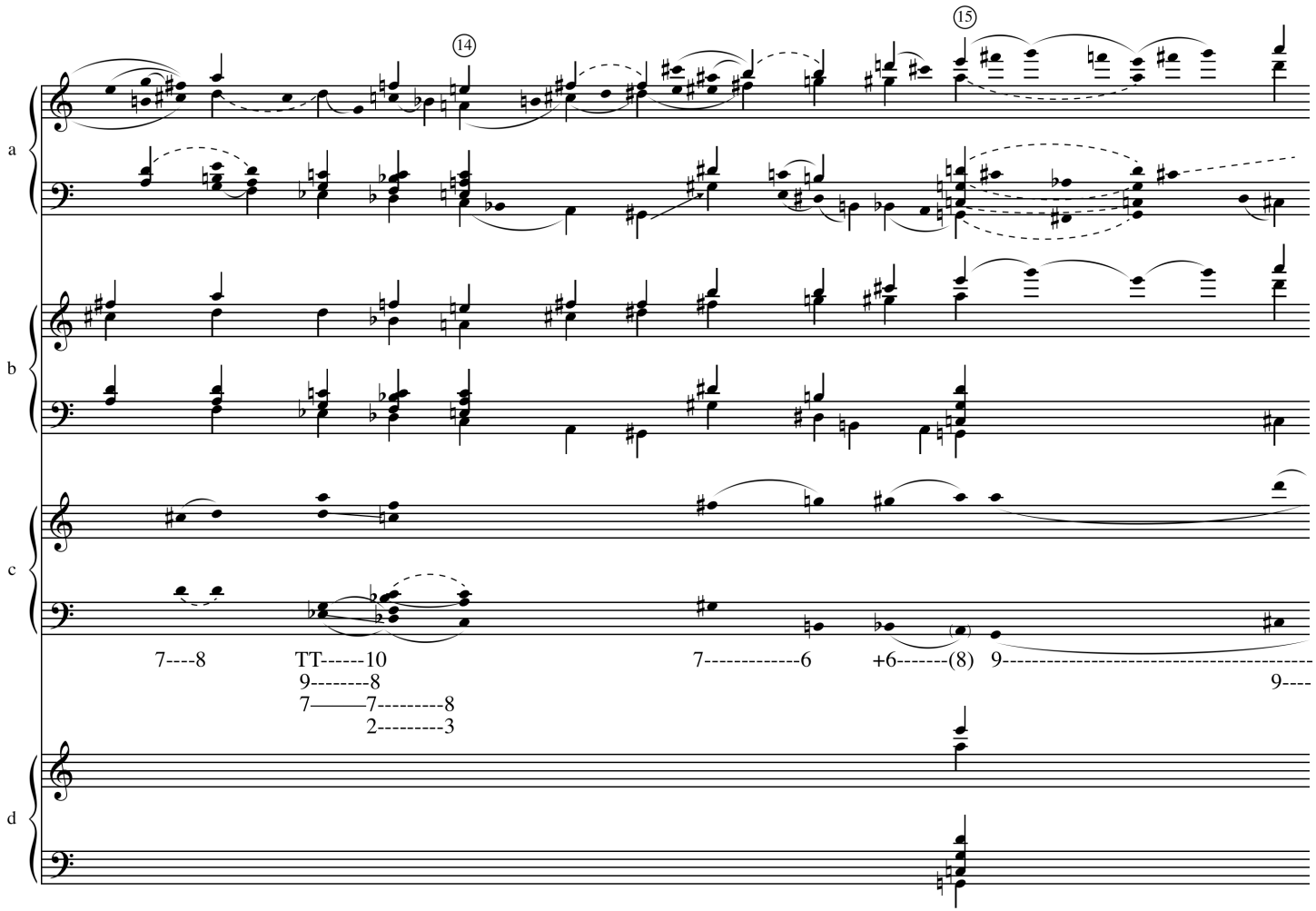
Figure 3.2. ***Interlude in A♭*** **Analysis**

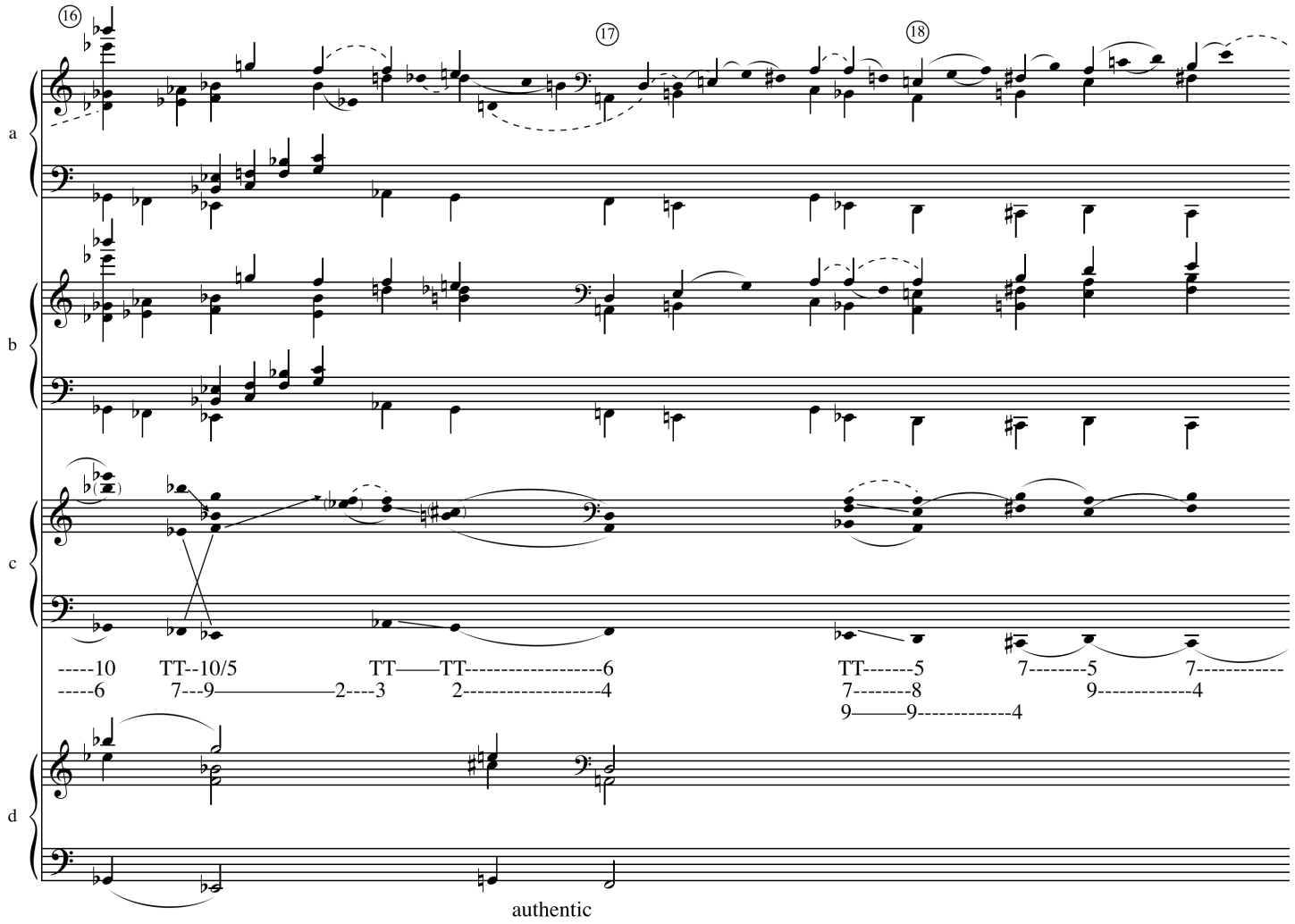


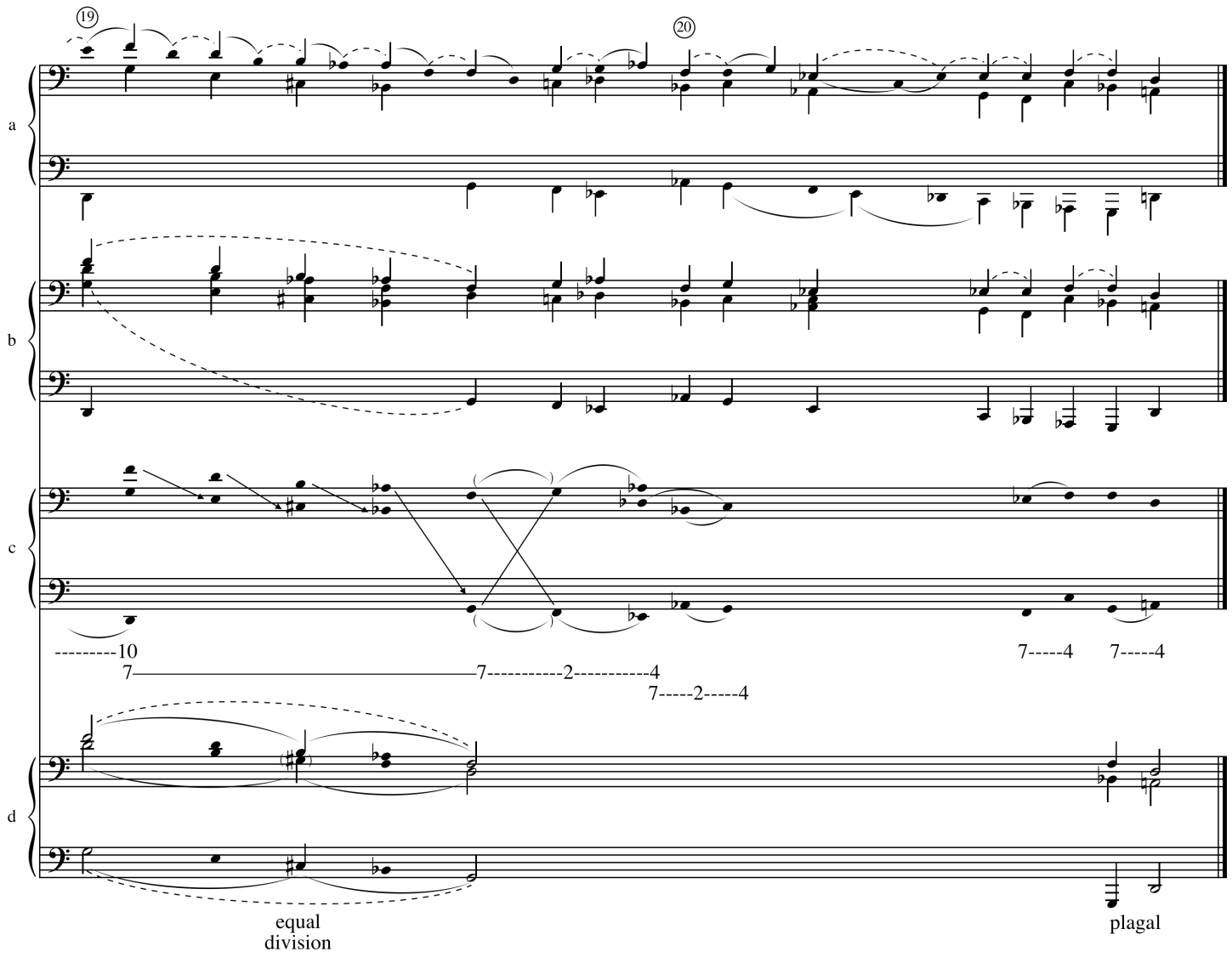

5
6
7
a
b
c
d
NCT
7—7—9—7---6 9 9-------8 2--------
9—7———2----3 7 7-------6
7--------6 7 7---------9-------10
9----6
equal division
equal division


8
9
10
a
b
c
d
----5 2--------5
9---4
7—7---(6)-------5
9—9----8
7----------5
7--------10
7----------3
2----------TT----------2----------
plagal
pivot
5
7
7
7
7
9/5 9/6 (4/2) 4/2
4/2
4/2


11
12
13
a
b
c
d
---TT----------2-------TT-------3
7——7----------5
TT----------8
TT---7---4
2---3
authentic
phrygian


14
15
a
b
c
d
7----8
TT------10
9--------8
7———7---------8
2---------3
7----------6
+6-------(8)
9----------
9----


16
17
18
a
b
c
d
-----10 TT--10/5 TT——TT----------6 TT-------5 7--------5 7----------
-----6 7---9————2----3 2----------4 7--------8 9----------4
9——9----------4
authentic


19
20
a
b
c
d
---------10
7
7----------2----------4
7-----2-----4
7-----4
7-----4
equal
division
plagal

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